

**IN THE CLAIMS:**

This listing of claims will replace all prior versions, and listings, of claims in the application.

1. (currently amended) An optical Optical sensor element (10), ~~in which there is comprising a light sensitive area (18) in a semiconductor substrate (1) comprising:~~  
~~a light sensitive area (18) in which by illumination charge carriers are releasable upon illumination, and~~  
~~two doping zones (15, 16) for receiving charge carriers released from the light sensitive area (18), as well as~~  
~~an electrode (13, 14) insulated against the light sensitive area (18) for production of a field gradient in the light sensitive area (18), thereby characterized, that~~  
~~wherein the insulated electrodes (13, 14) are provided in grooves formed in the surface of the substrate (1).~~
2. (currently amended) An optical Optical sensor element according to Claim 1, ~~wherein thereby characterized, that~~ each doping zone (15, 16) contacts an ~~one~~ insulation layer (12) of one of the insulated electrodes (13, 14).
3. (currently amended) An optical Optical sensor element according to Claim 1 ~~or 2~~, ~~wherein thereby characterized, that~~ at each doping zone (15, 16) an ohmic contact is formed.

4. (currently amended) An optical Optical sensor element according to Claim 1 ~~one of the preceding Claims, wherein thereby characterized~~, that the depth of the grooves is greater than the thickness of the doping zones (15, 16).
5. (currently amended) An optical Optical sensor element according to Claim 1 ~~one of the preceding Claims, wherein thereby characterized~~, that the depth of the grooves is between 5 and 40  $\mu\text{m}$ , ~~preferably between 2 and 25  $\mu\text{m}$  deep~~.
6. (currently amended) An optical Optical sensor element according to Claim 1 ~~one of the preceding Claims, wherein thereby characterized~~, that each doping zone (15, 16) is associated with a collection condenser for collection of charge carriers extracted from the doping zone (15, 16).
7. (currently amended) An optical Optical sensor element according to Claim 6, ~~wherein thereby characterized~~, that each collector condenser includes two conductive plates, which are provided in the grooves of the substrate.
8. (currently amended) An optical Optical sensor element according to Claim 1 ~~one of the preceding Claims, wherein thereby characterized~~, that in place of insulated electrodes (13, 14) of metal semiconductors structures

(31), built up electrodes are present, which form Schottky barriers (30) adjacent to the light sensitive area (18).

9. (currently amended) An optical Optical sensor element according to Claim 8, wherein thereby characterized, that the sensor element does not include any doping zones (15, 16).
10. (currently amended) An optical Optical sensor element according to Claim 1 ~~one of the preceding Claims~~, wherein thereby characterized, that on the surface of the light sensitive area (18) an ohmic p<sup>+</sup>-contact (32) is diffused in.
11. (currently amended) An optical Optical sensor array with a plurality of sensors according to Claim 1 ~~one of the preceding Claims~~, wherein thereby characterized, that respectively two sensor elements (10) adjacent in a first direction are provided on two sides of a common insulated electrode (13').
12. (currently amended) An optical Optical sensor array according to Claim 11, wherein thereby characterized, that the common insulated electrode (13') bordering doping zones (15, 16) of the two sensor elements (10) are connected electrically conductively.

13. (currently amended) An optical Optical sensor array according to Claim 12, wherein thereby characterized, that the two sensor elements (10) are joined or combined into a pixel.
14. (currently amended) An optical Optical sensor array according to Claim 11, wherein thereby characterized, that the doping zones (15, 16) bordering the common insulated electrode (13') of the two sensor elements (10, 10') are insulated electrically from each other.
15. (currently amended) An optical Optical sensor array according to Claim 14, wherein thereby characterized, that the insulating layer (12) of one of the insulated electrodes (13, 14) is thicker at the floor (26) of its groove than at its side walls (27).
16. (currently amended) An optical Optical sensor array with a plurality of sensors according to Claim 1 one of Claims 1 through 7, wherein thereby characterized, that in between two adjacent insulated electrodes (13, 14) of two in a first direction adjacent sensor elements (10), a zone (28) is formed insulating one of the electrodes (13, 14) is formed of against each other insulating zone (28).
17. (currently amended) An optical Optical sensor array according to Claim 16, wherein thereby characterized, that

the insulating zone (28) is formed by the semiconductor substrate (1) or a groove.

18. (new) An optical sensor element according to Claim 5, wherein the depth of the grooves is between 2 and 25  $\mu\text{m}$  deep.